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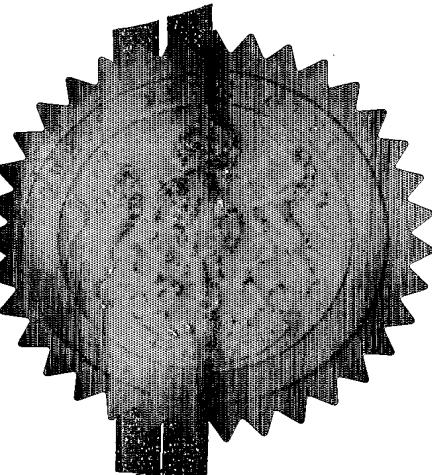
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1/77
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1. Your reference

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0327890.0

2. Patent application number

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3. Full name, address and postcode of the or of each applicant (underline all surnames)

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If the applicant is a corporate body, give the country/state of its incorporation

6417844002

4. Title of the invention

TOTAL TRUCK COVER SYSTEM

5. Name of your agent (if you have one)

NONE.

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(FSI: 177 17.1.05)

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Country

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Number of earlier application

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Patents Form 1/77

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Continuation sheets of this form

Description

6 SHEETS

Claim(s)

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Priority documents

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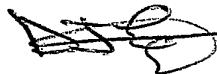
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TOTAL TRUCK COVER SYSTEM

This invention relates to an automatic side flap deployment system which when incorporated into a new or already existing front to back, side-arm or as they are sometimes called, wand-arm, roller cover system will enable the cover to fully and completely enclose and protect the load.

Road haulage and truck operators use various types and designs of tarp, tarpaulin or other material cover systems to cover and protect loads carried in the back of high sided open top trucks and the need for side flaps to completely enclose the loads to protect it from the elements and to control the loss of material etc. due to wind etc. is increasingly being required. Most, if not all of the available front to back, side arm, roller cover systems only cover the actual truck load carrying area allowing the elements to enter the load inside the truck along the sides of the cover and material to exit along the sides of the cover and onto the roads etc. The few covers that do incorporate any form of side flap require the operator from the exterior of the truck, to manually deploy the side flaps by reaching or climbing up and physically pulling them over and down the sides of the truck and manually secure them down, which apart from being an effort especially in wet, cold or freezing conditions could be extremely hazardous.

Where a "side-arm" roller cover system's method of operation of extending and retracting the cover is automatic, for example by the means of an electric motor activated from the drivers cab, this invention introduced into the cover system relieves the need for driver or operator to exit his cab, as all the functions including the deployment, securing, releasing and retraction of the covers side flaps is now performed in a simple quick operation to coincide with the covers extension and retraction, from inside the drivers cab making the operation comfortable and safe as well as saving time for the operator.

It is the principal aim of this invention to be either incorporated into the design of a new cover system or be supplied as an improved extra kit for adapting any "front to back", side arm, roller cover" systems that are currently used primarily, though not exclusively, on large open top trucks, on open top trailers or open top rail wagons or any other vehicles or containers that may or could use these types of cover systems. This invention is primarily designed for use with electrically operated "side arm" systems and will hereinafter be discussed solely in conjunction with that intended use, nevertheless it will be appreciated that the side flap deployment system could be used with manually operated "side arm" systems.

This present invention operates in conjunction with "back to front" side arm operated roller cover systems and utilises the direction, energy or force and movement of the side arms to automatically physically extend and retract side flaps as well as securing and holding the side flaps down.

A fully automated side flap deployment system comprising of a load cover with side flaps, opposing rotatably mounted arrangement of fixed cams or arms in a pivoted arrangement, buffers and stops to restrict the movement of these said arms, means to position the said arms, non extendable cords or the like extending and fixed between the outer extended rear area of the cover and the centre fixing point on the side flaps whilst running freely through the fitting on the end area of the forward arm of the pivoted activating arrangement and elastic strips or resiliently extendable means running from the front of the cover and through the side flap or flaps central fixing point or points to the rear area of the cover to retract the side flaps. This invention in component form could be supplied as an accessory to convert a previously fitted used old system or alternatively incorporated into and produced as a complete new cover system.

FIG. 1 shows an extended cover with the side flaps folded back onto the main cover and the elastic strips in their initial positions. Roller is positioned to the left.

FIG. 2 shows an extended cover with the side flaps deployed and the elastic strips in their fully stretched positions.

FIG.3 shows a side view of the truck back or container with the cover extended and the side flaps coming down the side of the container with the elastic strips in their fully stretched positions. Roller is shown to the top left position.

FIG. 4 shows the side view of the truck back or container with the side arm in its starting cover closed position. Also shown is the PAA in its pre-operating position.

FIG.5 show the same view as FIG.4 but with the side arms in their "cover fully extended" "parked" position and the side flaps deployed. Also shown is the PAA in its operating position.

FIG. 6 shows a top downward view of the container with the extended cover, which is attached to the rear cross bar which in turn is attached on each end to a side arm, in its rear "parked" position and the elastic strips stretched.

FIG. 7 shows the pivoted actuating arrangement or PAA for short.

FIG. 8 shows weld or seam line with side flap in its retracted "folded back on itself" position laying on the main cover from a side viewed perspective.

FIG. 9 shows an alternative design of the PAA of "one piece" construction.

FIG. 10 shows an alternative example of an extended cover with side flaps deployed showing a multiple strap arrangement with additional elastic strips (27) in their fully stretched positions.

The cover part of this invention is seen for example in fig. 1 & fig 2 and comprises of basically a rectangular sheet with side portions or flaps that are angled towards their centres terminating at fixing points (10) with an arrangement of stretchable elastic strips running from one end position to the other. An alternative cover with an alternative elastic strip arrangement can be seen in fig. 10.

The cover (seen best in fig.2 (24) could be made of any material that is satisfactory for its specific use or already being used in the truck cover industry, for example but not exclusively, a weather or water-proof synthetic textile material or fabric such as polyamide or P.V.C. vinyl , or canvas or a porous web fabric or material with holes in to allow air to pass, but not solid material or material particles, has angled shaped side flap areas (1) that terminate, when in an extended position, at a central outer fixing point (fig.2 & 3)(2).

Running through this centre point but not necessarily fixed are elastic strips (fig.1,2,3)(3) which are secured at one end to or in the region of the covers front roller (4) and secured at their other end to or in the region of the cover systems rear cross bar (5) . The position of the elastic fixing / securing points at each end of the cover are found to be most successful when positioned towards the opposing side of the cover, making a crossing "V" arrangement in the elastic when viewed both before and after the side flaps are extended. When this flapped cover is first fitted to the system the elastic may require a certain amount of pre-set tension to allow it to gain the additional extra tension required to pull or retract the side flaps successfully.

From this centre fixing point (2) of each of the folded back side flaps runs a non-stretchable cord of for example, wire , braid or other inextensible like means (fig.5)(6) one end being secured to this centre fixing point (2) and the other end secured to the outer end of the covers rear cross bar (fig.5)(7) i.e. the left flap cord connected and fixed to the crossbars left end (fig.6)(9) and the right flap cord connected and fixed to the crossbars right end (fig.6)(8).

These cords that run from their side flap securing / fixing points to their respective rear crossbar fixing points (fig.6)(8 & 7) are found to function best if they are of a specific length that correspond with the distance from the centre fixing point on the covers side flap, when it is retracted and laying flat on the main cover, and the outer corner of or other fixing point on or near the rear cross bar (8&7).

These cords, on their path from the flaps centre fixing point to their respective fixing points on or near the rear cross bar, pass through, for example a ring or roller (10) (fig.5) or other means that is attached to the end of the front arm on their respective left or right pivoted actuating arrangements that allows the cord to run through it freely. (Reference to cover systems rear cross bar being at the rear is used in this text but it could, if the system was used the reverse way become the "front" cross bar or even the side "cross bar.)

The rear arm (fig.5)(11) of the Pivoted Actuation Arrangement or PAA for short (fig.7) makes contact with the fixed buffer (12) during the final stages of the cover systems deployment. This action revolves or rotates the PAA over towards the roller end of the cover system during deployment or the reverse way during the covers retraction.

The pivoted actuating arrangement or PAA (one example shown in fig.7) is of fixed and rigid construction and can be made of any suitable rigid material, for example steel or iron and can be any shape or form that achieves the same working principals as the preferred arrangement shown in fig.7. The PAA has a central pivoting point (13)(fig.5&7), a lower arm (15) fitted with a counter balance weight (14) a rear top arm (11) and a front top arm (16) assuming the cover system referred to is laid out as shown in fig.15. Fig. 7 shows the PAA's three arms which are rigidly pre-fixed at the central pivot point (13) at pre-determined angles to achieve their functions. These angles are based on the size and type of container the cover fitted with this system is being or will be used with. The PAA can be of alternative designs that create the same functions. An example is shown it fig. 9.

In a preferred arrangement and assuming the cover system for this example extends from front to the back of the truck back box and is using the "Y" (fig.7 or Fig. 9) version of the PAA, the fixing / position of the PAA along the length of the side arms (fig.4 & 5)(17) which travel backwards and forwards on pivot 17A (fig. 4,5 & 6) to extend and return the cover from its roller, is determined by the position of the top front arms ring fixing (10) at its fully forward rotating point being in line with and below the central fixing point (2) on the fully extended cover when the rear cross bar is in its fully extended "parked " position as in fig.5 & 6, therefore, when operating the cover system, top front arm (16) on the PAA is giving downward force to the flap fixing point as shown in fig.5. The PAA may also be incorporated at any position along the length of the side arm (fig. 5 & 6)(17) that it is found to operate successfully.

In a preferred arrangement there can be "stops" (19) positioned on the trucks body sides (fig.6)(18) to allow the front arm (16) of the PAA to come to a stop at a required position shown in fig.4 and stops (fig.4 & 5)(20) positioned on for example, the top of the trucks body (fig.4)(21) to guide the cords (6) back onto the retrieving roller.(fig.4,5 &6)(22).

When a "side-arm" front to back "electrically operated" roller cover system fitted with this invention is extended the upper rear arm (11)(fig.4) of the Pivoted Actuating Arrangement (fig.7) or PAA for short and referred to elsewhere in this text as such, (one of which is fixed / fitted / incorporated in or into both of the side arms on opposite sides of the truck) comes into contact with the fixed position buffer block (12) which for this example is fixed to the truck's side. This contact would be made when cover deployment is towards its completion and the side arms are nearing their "parked" position at the rear of the truck as in fig.6.

This rear arm of the PAA (11) is kept in its correct position / angle for making contact with the buffer (12) by means of, for example a weighted lower arm (15) which holds the whole arrangement on its centre pivot in a "Y" shape configuration .

The position and function of both the front and rear upper arms (11 & 16) may also be achieved by other configurations of PAA. Other methods of counter weighting the PAA such as springs or levers may be used.

The final backward / downward travel of the cover systems side arms and cross bar forces the PAA (fig.7) on both side-arms to revolve in a circular movement causing the front arms (16) to travel in a downward direction pulling on and tightening the cords (6) and thereby pulling the side flap outwards and downwards over the side of the truck , and thereby becoming fully extended at the same time as the covers rear cross bar finally seats in its rear parked position.

The now extended longitudinal elastic straps (fig.6)(3) which pass/travel through the centre fixing on the side flaps (2) will now be taught. As an example they could consist of a multiple strap arrangement (fig.10) with a number of additional straps (27) fixed at their ends at various positions at opposing ends of the cover, all fixed or travelling through the centre or multiple flap fixing, but could, as shown in fig.1. consist of one elastic strap for each side flap, which as I have already stated would now be taught, passing through the centre flap fixing (2) and will have now travelled across and over the cover and down the sides of the truck (fig.3 & 6) creating additional pressure on the side flaps to hold / secure them down and against the actual truck's top edges and sides. This or these elastic straps along with the tight downward pulling centre cord will create a downward and sideways tension on the side flaps making the side flaps tight along the length of the flap.

When the cover system is retracted the whole works in reverse – the rear arm of the PAA on both sides parts contact with the buffers, the lower weighted arms (15) force the arrangement to revolve in a backward movement allowing the cord (6) to loosen and the taught elastic (3) to pull and retract the side flaps back over the truck sides and return to their original folded-in flat position on the cover allowing it to return onto its roller in a neat arrangement.

The reason for keeping the top front arm (16) on the PAA at the correct angle and position by means of for example the lower weighted arm during the covers rewinding process, is to allow it to make contact with the fixed "stop" (19) on the side of the trucks top outer edge of its body, thus forcing it to revolve slightly backwards with the front arms (16) ending up in a raised parked position directly in the vicinity of the "cords" (6) securing or fixing point (fig.5)(7) on the cover systems cross bar (fig.6)(23). When the cover system is fully retracted this allows the entire length of "cord" to be taken up and onto the roller.

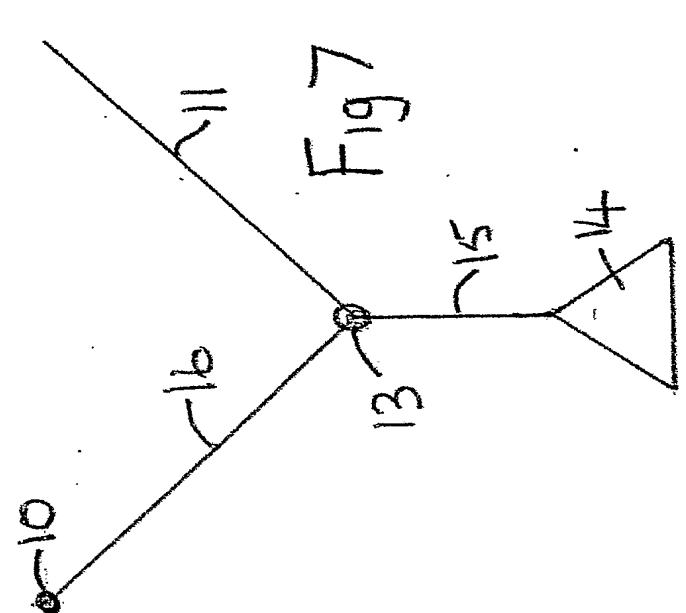
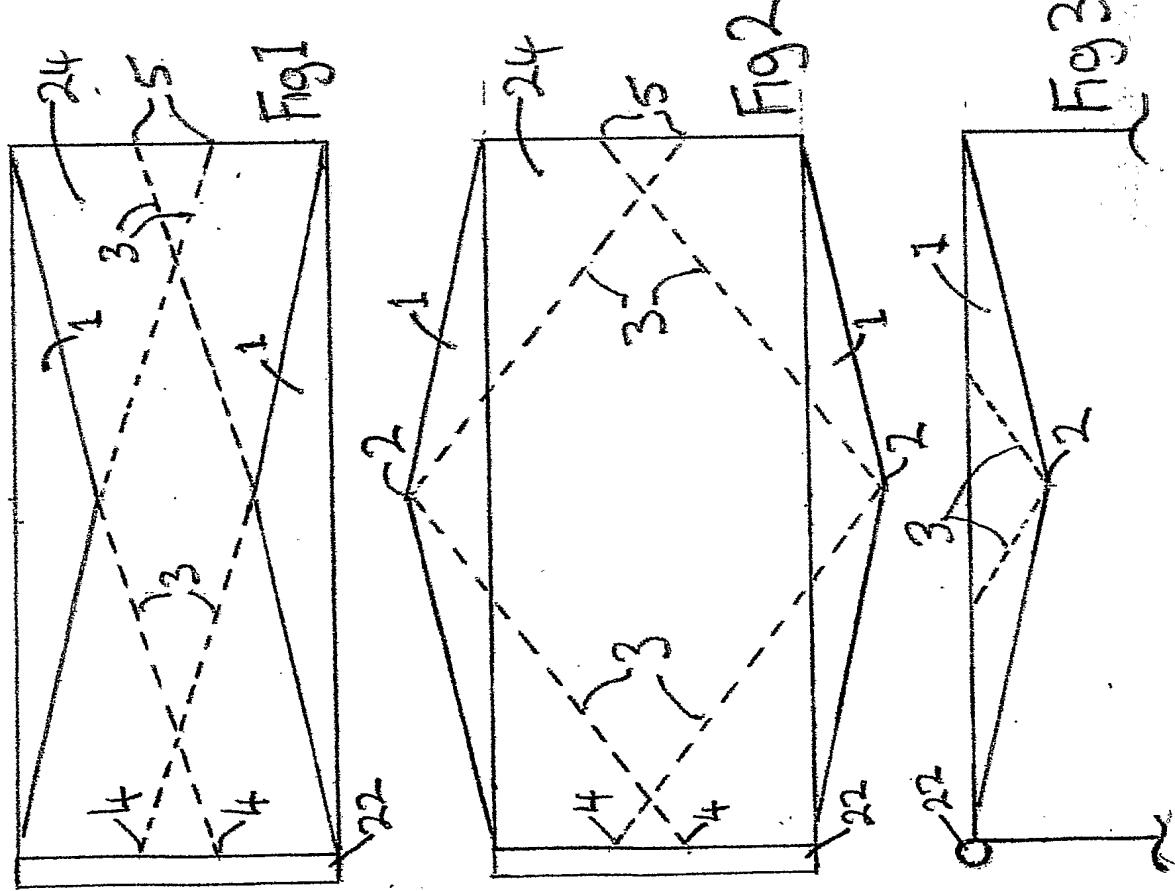
In a preferred method it has been found that the side flaps return to their rolled-up "laying flat" position better on the cover and the cover retracts onto its roller more neatly and successfully if the actual side flap folds in the cover have during their manufacture been built with for example, a narrow weld or seam sewn in it along its entire length of folded edge whilst in a folded position making the flap naturally fold want to fold back to lay on the main cover. (fig.8)(23)

The example of the PAA shown in fig. 9 could have a shaped contact point (26) on the end of top right arm (11) to allow smoother contact with buffer (12).

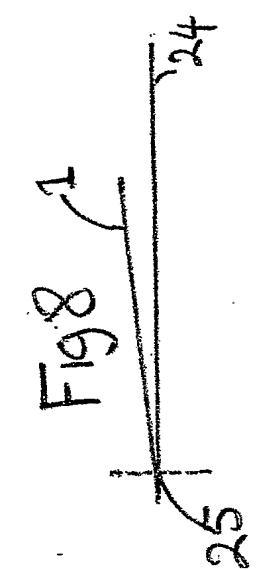
This invention extends to the complete cover arrangement or assembly independently being used on its own as for example shown in fig. 1, 2 & 10 and specifically described in this application, but without the cord (6) running from the covers centre fixing point (2) to the cross bar fixing point (7 & 8) and the rest of the parts, components and mechanisms described in this application. A cover such as this could be used on its own, for example, fitted independently of the rest of the parts, components and mechanisms described in this application, to a roller on a "side-arm" roller cover system or any other roller type cover system, or just by itself as a throw over cover and by means of for example a cord attached to fixing point (2) be manually, once the cover system or cover has been fully extended over the load, pulled down the sides of the truck by hand by means of this cord.

This invention extends to a cover on its own as described specifically above or the cover in combination with all or some of the components described in this application.

Likewise this invention could extend to the PSS combined with the other components in this application being used independently of the cover in this application to operate an alternative or similar cover arrangement.

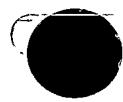


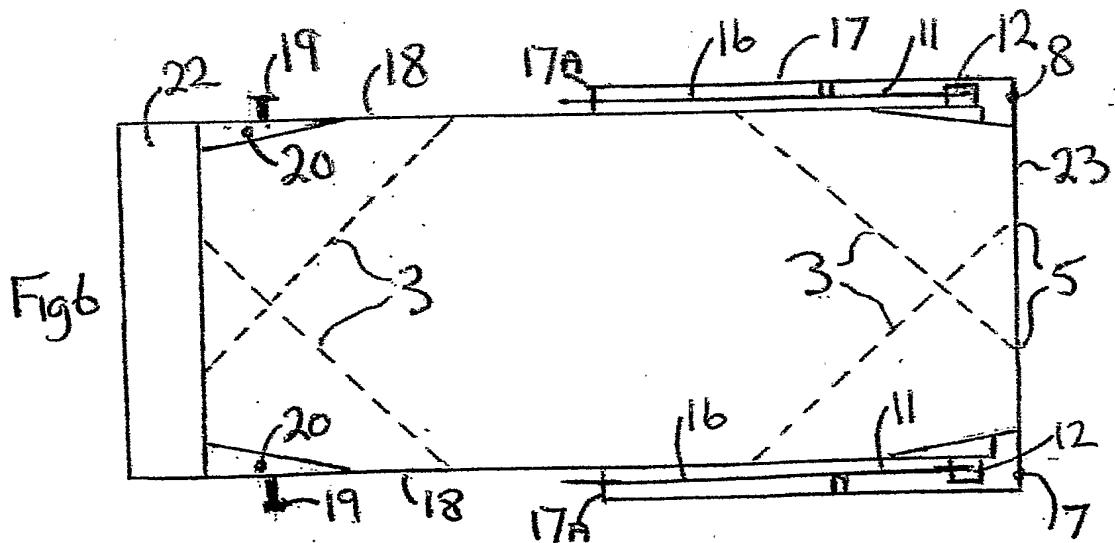
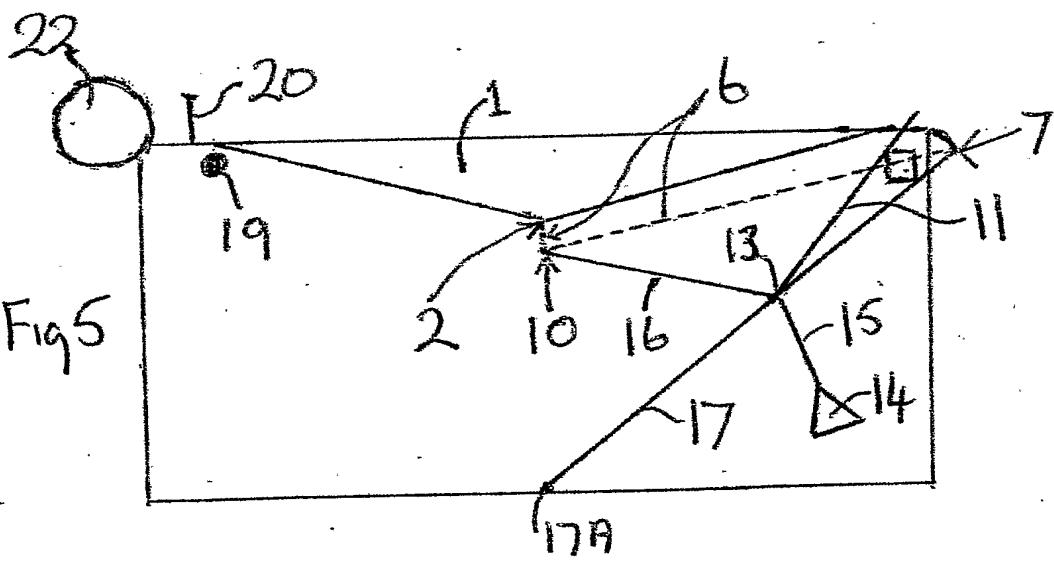
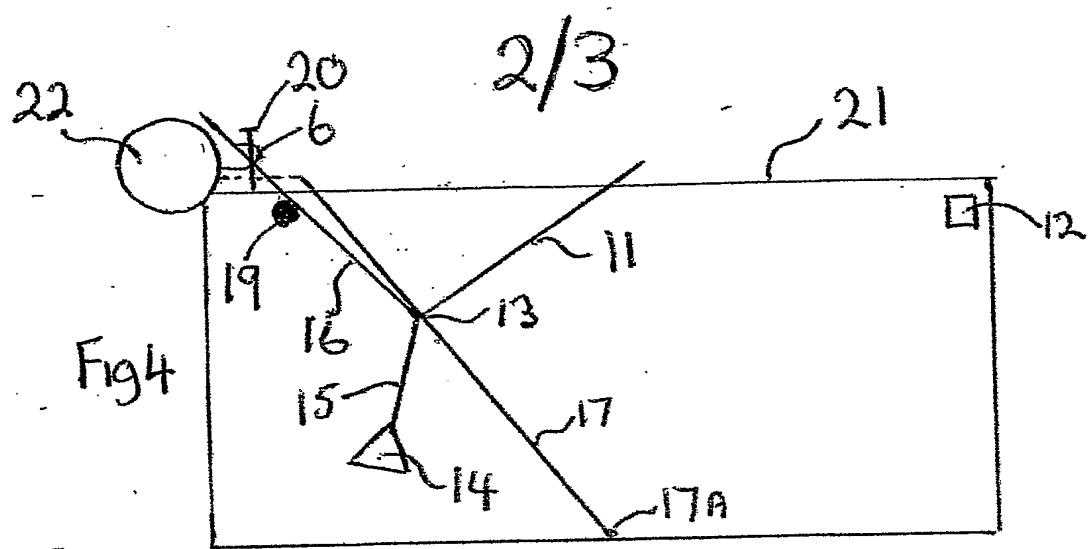
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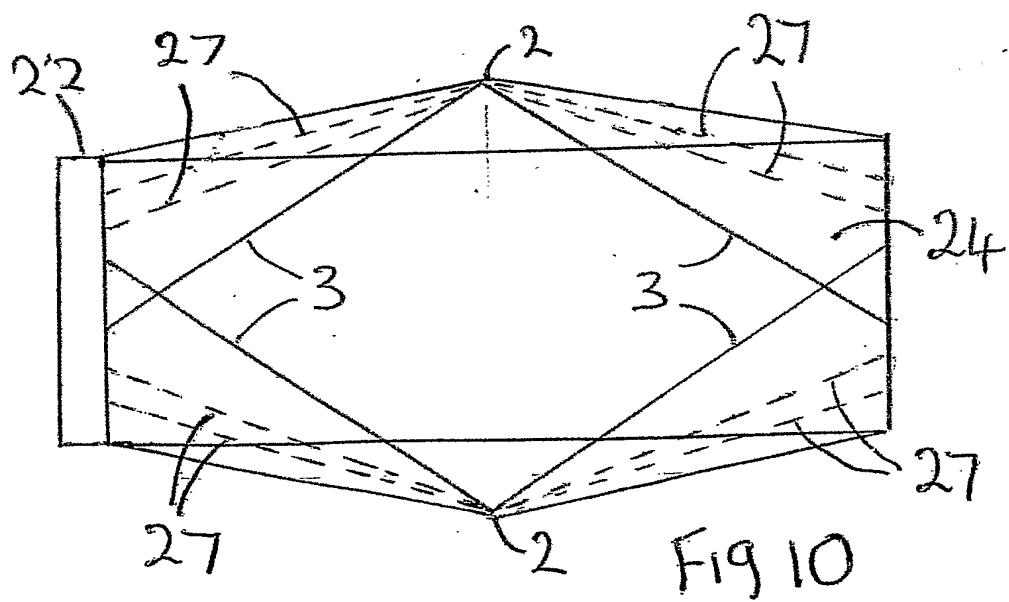
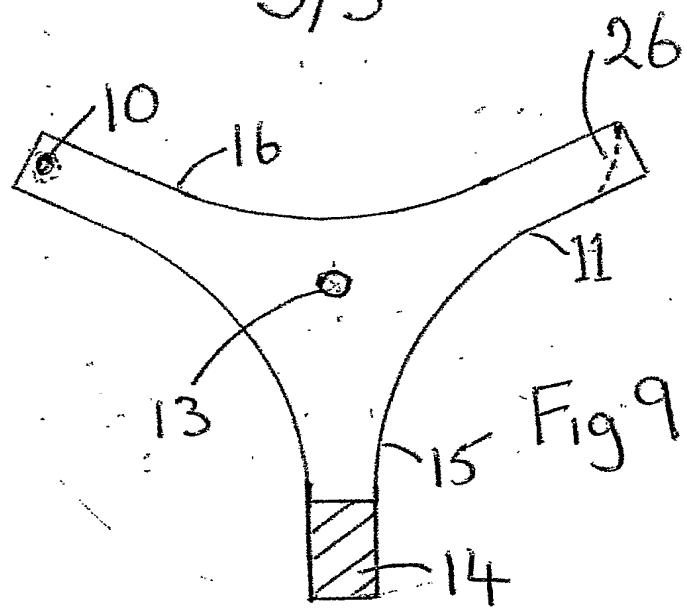
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